

CLAIMS:

We claim:

1. A method, comprising:

determining a time delay (202) between an actual flow rate and a measured flow rate

5 in a flow meter;

providing the time delay to a proving device used to prove the flow rate of the flow
meter.

2. The method of claim 1 where the time delay is determined by introducing perturbations
10 in a flow and measuring how long before the perturbations are detected by the flow meter.

3. The method of claim 1 where time delay is determined by calculating the delay due to
electronics and filtering in the flow meter electronics.

15 4. The method of claim 1 where flow meter is a Coriolis flow meter.

5. A method, comprising:

providing a flow of a known quantity of material, over a first time period, to a flow
meter;

20 receiving measured flow data, for a second time period, from the flow meter;

receiving a delay time from the flow meter where the delay time is the time
difference between the measured flow and the provided flow in the flow meter;

shifting the measured flow data from the flow meter by the delay time.

25 6. The method of claim 5 where the shifting amount is a function of a damping amount in
the flow meter.

7. The method of claim 5 where the shifting occurs by delaying a start and stop signal that
indicate a beginning and an end of the first time period.

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8. The method of claim 5 where the flow meter is a Coriolis flow meter.

9. A method, comprising:

setting a plurality of measurement parameters for a flow meter;

determining a time delay between an actual flow rate and a measured flow rate in the flow meter when the flow meter is operating with the set measurement parameters.

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10. The method of claim 9 where the plurality of measurement parameters comprise a damping rate and an operating mode.

11. The method of claim 9 where the time delay is provided to a prover used for calibration
10 of the flow meter.

12. The method of claim 9 where flow meter is a Coriolis flow meter.

13. The method of claim 9 where the time delay is determined by introducing perturbations
15 in a flow and measuring how long before the perturbations are detected by the flow meter.

14. The method of claim 9 where the time delay is determined by looking up the time delay
in a table that maps the plurality of measurement parameters to a time delay.

20 15. A prover, comprising:

a section of tubing (104) having a known diameter;

a first sensor (S1) at a first location on the section of tubing;

a second sensor (S2) at a second location on the section of tubing;

25 a device (102) configured to move inside the section of tubing (104) between the
first location and the second location;

the first and second sensors configured to send a first and second signal,
respectively, when the device passes the first and second locations;

a flow computer configured to receive the first and second signals from the first and
second sensors;

30 the flow computer also configured to receive flow measurements from a flow meter
to be calibrated;

the flow computer also configured to receive a delay time from the flow meter to be calibrated, and configured to shift the received flow measurements with respect to the first and second signals by the delay time.

5 16. The prover of claim 15 where the shifting occurs by delaying the first and second signals from the first and second sensors.

17. A Coriolis flow meter, comprising:

a conduit configured to contain a flowing material;
10 at least one driver configured to vibrate the conduit;
sensors configured to measure the position of the vibrating conduit;
electronics configured to receive the measured position of the conduit and convert
the measured position into a measured material flow rate;
a storage area configured to store at least one delay time between an actual material
15 flow through the conduit and the measured material flow through the conduit.

18. The Coriolis flow meter of claim 17 where the electronics are configured to operate in at least two modes having different operating speeds and where there is a different delay time stored in the storage area for the two different modes.

20 19. The Coriolis flow meter of claim 17 where the electronics are configured to operate with at least two damping rates and where there is a different delay time stored in the storage area for the at least two damping rates.

25 20. A Coriolis flow meter, comprising:

a means for vibrating a conduit containing a flowing material;
a means for measuring the phase of the vibrating conduit;
a means for converting the measured phase into a flow measurement;
a means for storing a delay time that indicates the time delay between an actual flow
30 through the meter and the flow measurement.